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ABSTRACT

The traditional definition of student persistence, advanced by Vincent Tinto in 1975, is that of attendance until degree completion. This model, however, does not adequately reflect community college student attendance patterns. To develop a conceptual model of community college student persistence, a study was conducted of the attendance patterns of 510 students attending a southeastern Texas community college during spring semester 1992, using student goal-attainment as the indicator of successful termination. Specifically, the study examined the relationship between goal commitment for five groups of students (i.e., those preparing to transfer, preparing for a new career, retaining current or upgrading skills, attending for personal reasons, and upgrading basic English skills) and the student's perception of gains on the following general educational goals: career preparation; arts; communications skills; mathematics, science, and technology; personal and social development; and perspectives of the world. Perceptions of gains in these six dimensions were measured by the "Estimate of Gains" section of the Community College Student Experiences Questionnaire (CCSEQ). Results indicated that the more strategic a student's goal-commitment (i.e., the longer the student expected to attend college), the more likely that he or she would perceive gains in the six areas. In addition, members of the transfer group were the most satisfied with their college experiences and showed a greater tendency to persist until goal attainment. A literature review, detailed data analyses and tables, implications and recommendations, and an 86-item bibliography are included. (PAA)

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USING THE CCSEQ IN INSTITUTIONAL EFFECTIVENESS: THE ROLE OF GOAL COMMITMENT AND STUDENT'S PERCEPTION OF GAINS

by

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Using the CCSEQ in Institutional Effectiveness
Abstract

Student persistence has been studied for several decades. The recent research interest in student persistence started with Spady's study which was published in 1970. Spady based the development of his model on an early 1950's study of suicide by Durkheim which showed a relationship between the lack of social integration and suicide.

Tinto provided added impetus to the research interest in student persistence when he published his model in 1975. He added academic integration and goal commitment to Spady's model. Tinto based his model on the conjecture that the more a student was socially and academically involved in college activities, the more likely the student would be to persist.

Much of the student-persistence research has been centered on four-year educational institutions and based on the traditional paradigm of a student starting college immediately out of high school then completing a bachelor's degree within four years. Using this degree completion paradigm and Tinto's persistence model proved to be too tempting for two-year college student persistence researchers. However, Vorhees, Padula, and even Tinto argued against this atheoretical use of the traditional models of student persistence for two-year colleges.

Community college students are nontraditional; that is, they are, on the average, older, go to school part-time, and are not compelled to finish a degree within a prescribed time limit. These differences from the traditional four-year-student paradigm demand a different model for two-year-student persistence.

In order to help build a foundation for developing a two-year student persistence model, this study examined one independent categorical variable, goal commitment, and six dimensions of the student's perception of gains construct as the dependent variables. These six dimensions were Likert-type scales which measured the gains a student had perceived they had made on twenty-three general education goals. The goal-commitment variable consisted of the following five groups of students: those who were, (1) preparing to transfer, (2) those who were preparing for a new career, (3) trying to remain current or upgrade their skills, (4) attending for personal interest, and (5) trying to upgrade their basic English skills. The six dimensions of the student's perception of gains construct were: (1) career preparation, (2) arts, (3) communication skills, (4) mathematics, science, and technology, (5) personal and social development, and (6) perspectives of the world.

The sample consisted of 510 students selected by a stratified random sample from the population of students attending a southeastern Texas community college during the Spring Semester, 1992. The instrument used was the Community College Student Experiences Questionnaire (CCSEQ), developed by the Center for Evaluation which is directed by Dr. C.

Robert Pace. A manual accompanies the questionnaire which gives the inter-item correlations, results of factor analysis, and Cronbach's alpha for the various sections of the questionnaire. The factor analysis of data collected by the authors of the CCSEQ resulted in the six dimensions of the student's perception of gains construct used in the study.

The definition of community college student persistence used for this study focused on a student's attending college until a goal, which s/he had expressed as important, was attained. This nontraditional definition neither included a time limit nor degree attainment as parameters.

The methodology consisted of multivariate analysis, univariate analysis, and a priori contrasts. The multivariate analysis, testing the variables, as a system, was significant (Wilk's lambda = .678, $p < .05$). These results suggested that there was a significant difference between the goal-commitment groups with respect to the six dependent variables.

Significant univariate tests followed, which suggested that there was a difference between the goal-commitment groups with respect to each of the six dimensions of the student's perception of gains construct. A priori contrasts were used to test for a significant difference between the transfer goal-commitment group and the other four goal-commitment groups with respect to the six dependent variables. Most of those contrasts were significant. The results of these contrasts suggested that the more strategic the student's goal-commitment (that is, the longer the student expected to attend college), the more likely s/he perceived as having greater gains on the twenty-three general education goals. These results also indicated that the transfer group was more satisfied with their college experiences than the other goal-commitment groups, and would have a greater tendency to persist until goal attainment than the others.

As for further study, many other grouping variables could be used in an attempt to find the differences between these groups with respect to the student's perception of gains. More research is also needed to show whether there is a significant relationship between student satisfaction, goal attainment, and student persistence. Similar research will help in the development of a theoretical model of community college student persistence.

Persistence is an interest to institutions because of the institution's goal of helping student's fulfill their potential. Keeping students around an institution long enough to help them attain their goals, is part of this strategy.

Using the CCSEQ in Institutional Effectiveness

The Role of Goal Commitment

and Student's Perception of Gains

Introduction

In 1965, there were 654 two-year colleges in operation in the United States. By 1985, the number of two-year colleges had more than doubled, reaching a total of 1350 (Adelman, 1992). The two-year college (also known as junior college, community college, or technical institute) entered the postsecondary educational milieu offering easy access to higher education for all, making going to college very affordable for most, and usually was within easy commuting distance for most students. Not only did the community college grow rapidly during this period, but postsecondary education in general grew quite rapidly for several reasons. One reason was the growth in the number of high school graduates which increased from twenty-five percent of those entering high school in 1924 to seventy-five percent in 1960 (Deegan and Tillery, 1988). Not only were there more students in the educational system because of the population explosion, but more of these students were graduating from high school.

During this time some university and college leaders supported the idea of an "in-between" school which bridged the gap between high school and colleges. These leaders believed that this "in-between" experience would smooth the

transition from high school to college. (This phenomenon tacitly recognized a problem with student persistence.) Others conjectured that if another institution provided the freshman and sophomore years of college, more time could be spent by four-year colleges on the more advanced students - a much more efficient use of faculty resources. Both of these conjectures helped spur the growth and acceptance of the two-year college.

After the turn of the century, the manufacturing industry grew very rapidly, especially during and after World War II. This placed a tremendous demand on society for a more skilled workforce. The educational system tried to meet that demand by introducing more vocational/technical education which resulted in causing even more growth in postsecondary education, especially for the two-year college (Cohen and Brawer, 1989).

The community college also flourished because of the added demands of society for education to solve all of its ills. For some, education seemed to be the panacea for such problems as high unemployment and an overburdened welfare system. This notion was laced with the belief that the more years of education a person had the greater the benefits for that person which in turn profited society (Cohen and Brawer, 1989).

Because of the easy access, affordability, and acceptance of community colleges as legitimate higher educational institutions, more subpopulations were able to

access higher education than ever before. Deegan and Tillery (1988) comment on this for the 1970-1980 time-frame. "Participation rates of many underrepresented groups (reentry women, ethnic groups, the disabled, displaced workers) increased sharply in this generation." (p. 22) With the large number of students entering higher education, keeping students was not much of an issue. If a student withdrew from college, another student took his/her place. However, this scenario has changed dramatically. "While the 1950s and 1960s were boom years for higher education, the past fifteen years have been a period of retrenchment. As the traditional college-age population of eighteen to twenty-four year olds began to shrink in the late 1970s, many colleges and universities were forced to do a better job of recruiting and retaining students." (Porter, 1991; p. vii) This same phenomenon occurred during the early 1990's with the decrease in eighteen year-olds projected to bottom out in 1992 (Cohen and Brawer, 1989). Community colleges will sustain their enrollments because of several reasons; the demand for higher education will remain high, enrollments in higher education by minorities will increase, industries increasingly will continue to enter into partnerships with community colleges to do the training of their employees, and the community college will continue to get their share of the traditional college student (Cohen and Brawer, 1989). The pressure on community colleges to provide education to meet the needs of an ever-expanding diverse society will increase.

Because of this pressure, community colleges will need more resources, not less. However, the decrease in funding of higher education and the increase in the demand for institutions to live up to their responsibility and commitment to the student has created yet another crisis in higher education of doing more with less.

This crisis has been brought about by fed-up taxpayers and legislators who are focusing on educational results and questioning the extant integrity of many public institutions including community colleges. This shift from a laissez faire attitude towards higher education to the examination of results/outcomes of a student's college experience is evidenced by the demand on the part of accrediting agencies and legislatures that colleges of all types be able to show that they are effective; that is, institutions demonstrate with relevant data that their missions and goals are being attained and there is congruency between what a college purports it does and what actually happens to its students. Determining a response to this congruency issue requires a shift from an institution using input measures to show institutional effectiveness to outcomes and/or student performance measures. This shift demands that colleges pay attention to student persistence to ensure their students will attain their goals.

Another phenomenon that has occurred in public education causing concern for what educational institutions are doing is presented in the Department of Education's report, A

Nation At Risk and Bloom's Closing of the American Mind, two well-known publications which lament the plight of elementary and secondary education in the United States. The number of functional illiterates in our society and high school completers who are underprepared in basic reading, writing, and mathematics skills has indeed shocked the nation. Although these students may have access to higher education, it is presumptuous to assume these students are prepared for college-level courses. The response to this upturn in the number of underprepared students by the community colleges has been favorable. The community college attempts to remediate a large percentage of these underprepared students.

> Even though the decline in student ability stabilized in the 1980s, compensatory education grew. The rise in remedial course enrollment occurred because student ability had sunk so low that college staff members, legislators, and the staff of the universities to which the students transfer had had enough. The dropout and failure rates were unconscionably high . . . . Increased enrollments and programs in remedial education were the result. In 1987, 13 percent of all credit course enrollment in Illinois community colleges was in remedial courses . . . . The funding for these courses sometimes came through the regular academic instruction budget, as in Austin Community College (Texas) where one-third of all state-reimbursed funds were allocated to remedial education. (Cohen and Brawer, 1989; p. 237)

Because of this increase in underprepared students, college-level course work has suffered, exacerbating the lack-of-persistence problem. Students who are not prepared for college courses usually do not persist very well no matter how persistence is defined and/or measured.

Still another phenomenon influencing community college enrollment, because of the "Technological Revolution" and "Knowledge Explosion", is the emphasis on "life-long learning."

> Adults will have increasing needs for recurring education. Among the implication for community colleges is that most suppliers of education will respond to such adults' needs for occupational retraining, academic remediation, and lifelong learning. This competition will require the colleges to offer cost-effective programs falling within their mission and with verifiable learner outcomes. (Deegan and Tillery, 1988; p. 29)

Since technology evolves and changes so rapidly and many of the current skills are being replaced by automation, new job skills are needed. Many of those who are currently employed will change careers at least once in their worklife which will require retraining or learning a new skill to prepare for a new career. Incumbent upon these institutions providing retraining is retaining these students until their goals are met.

Taken together, the phenomena of underpreparedness,

life-long learning, and retraining workers have brought about a change in the student profile of college students, especially on community college campuses. The traditional transfer paradigm no longer fits the behavior of all community college populations. This change in student profile and needs places demands on community colleges to develop curricula which represent the needs of these populations and to continue to examine their mission and goal statements.

Couched in this new paradigm is the student persistence issue. Easy access should not mean easy exit and the open-door should not turn into a revolving door. A community college must have a strategy in place to monitor and assess student persistence so that students attain their goals and community colleges achieve a higher degree of effectiveness.

Need for the Study

Financing of higher education has become problematical in Texas as in other states. Where money for increased state aid for higher education was available just a few years ago, educational institutions are now facing reductions in state appropriations. Many states are reducing higher education budgets and decreasing appropriations to higher education (Southern Regional Education Board, 1991). Many demands are being placed on the tax dollar and new taxes are not in vogue. The competition for the tax dollar has brought about new demands on public institutions which have to be met before their state appropriations are received. The

major demand which seems to be emanating from this financial crisis is for effectiveness (which in some regards is an accountability issue) - institutions doing what they say they are doing and proving it.

The Southern Region Education Board (SREB) has reported the reluctance of states to continually give money to higher education without proof of effectiveness. In fact, some states are withholding a percentage of an institution's budget appropriation until certain outcome goals have been met. Taxpayers are demanding a return on their investment. This demand suggests that the measure of an institution's effectiveness becomes the surrogate of the state's goal of fiscal responsibility. If courses and programs are designed to teach concepts and develop skills that are prerequisites of success in jobs or classes at a transfer institution, students must complete the prerequisites. It is imperative for students to stay in college until their goals have been attained. In order to respond to this demand, several persistence strategies can be imposed on the educational system helping students stay in college until they attain their goals. However, a precursor to implementing any of the strategies suggested is the development of a conceptual student-persistence model which requires a usable definition of persistence for community college students.

Several unassailable facts are evident in the literature related to persistence: (1) education is now considered a lifelong process, (2) the average worker will change careers

at least once, and probably several times before retirement, (3) the financial responsibility for the undereducated is now beyond what society can afford to maintain let alone add to it, and (4) colleges should be held responsible for doing what they say they are doing. Philosophical changes are needed by educators and leaders alike.

> One of the most remarkable and scandalous aspects of American higher education is the absence of traditions, practices, and methods of institutional and social accountability. How can colleges and universities assure the American people and themselves that they are doing what they say they are doing? How does anyone know that the curriculum really "works?" There must be ways of demonstrating to state legislatures, students, and the public at large that the colleges know what they are doing (or do not know) and that they are doing it well (or poorly). (Association of American Colleges, 1985; as reported by McClenney, 1989; p. 47)

Community colleges are the colleges-of-choice for not only first-time-in-college students but for the returning student who needs retraining to upgrade current skills or training for a new career. As a result of the change in the student profile from the traditional eighteen to twenty-four year old student to the older, part-time nontraditional student, and the demand for accountability and effectiveness, higher education must pay much more attention to student persistence.

The higher educational institution, be it two-year or four-year, is obligated to fulfill its commitment and responsibility of helping students attain their goals. Increasing student persistence is but one endeavor that two-year colleges can undertake to help fulfill this commitment. In order to attend to this commitment, the ingredients of student persistence must be studied and strategies developed and implemented which are designed to help students reach their goals. Students thereby contribute even more to society's resources and help reduce the costs to society for maintaining the underproductive. Educational institutions must do their part to stop the waste of human resources.

Statement of the Problem

The current models used by most researchers studying persistence are the ones developed by Tinto (1975), Pascarella (1983), Bean (1980), and Bean and Metzner (1987). Even though there are many articles relevant to community college persistence research, the research does not adequately address student persistence in community colleges (Vorhees, 1987: Tinto, 1987). When community college student persistence is studied, the above models provide a starting place for researchers but with little consideration for the model's assumptions. For example, since Tinto (1975) investigated four-year institutions when developing his model, making application of his model to two-year institutions is presumptuous. Researchers having a

four-year-college mind-set of student persistence play a large role in biasing the development of a community college student persistence model.

Tinto's model had its origins in a study of suicide by Durkheim (1951) and an enhancement of Durkheim's study by Spady (1970). The results of the Durkheim study suggested a relation between social integration and some forms of suicide; that is, the more a person shares values with a group, the less likely that person will commit suicide. Tinto added academic integration and goal commitments to Durkheim's suicide model. Tinto's model has guided much of the persistence research for four-year and two-year college students.

> There are many studies in the literature specifically concerned with community college retention. Since 1970, nearly six hundred studies have been reported through ERIC dealing with retention/attrition issues. Despite the large number of studies, few have approached the problem with a theoretical perspective. Measuring community college success is a departure from the more traditional studies conducted using a theoretical model on four-year institutions. A framework which refines definitions to account for the multiple outcomes unique to community colleges is needed. Definitions of successful outcomes are reported in the literature and are important in constructing a community college model. (Daley, 1990; p. 6)

Bean (1980) admits the possibility of the inapplicability of the Tinto model to the community college student. Padula (1989) and MacCaffrey, Nora, and Maury (1989) also described their discontent with the application of the Tinto Model to community college students. However, the four-year paradigm developed by Tinto plays a prominent role in community college persistence research.

The basic premise upon which two-year college persistence researchers base their model is the four-year student persistence definition - completing the degree requirements within four years. This definition does not describe the behavior of community college students.

> Community college students as a whole are older, are much more likely to attend college part-time, and because of the nonresidential nature of most community colleges, are commuters. Community college students also attend classes for a wide variety of reasons other than obtaining a degree, including self-improvement, career advancement, vocational certification, and earning credit to transfer to a four-year college or university. Consequently, persistence to degree completion may not be a valid measure of actual persistence behavior for community college students. (Vorhees, 1987; p. 116)

Many researchers find it difficult to adjust to the community college student profile described by Vorhees. However, research using the four-year models does provide insight into

possible variables needed to help describe the persistence behavior of the two-year college student. The need is to approach the study of community college persistence with the intent of conceptualizing a persistence model for the institution being studied. From this model, relationships among the variables presented can then be studied.

> Studies of community college are over whelmingly descriptive in scope. No conceptual models of student persistence behavior have been advanced, designed <u>specifically</u> for the two year college setting, which adequately account for student background characteristics and how students interact within the community college environment. (Vorhees, 1987; p. 115)

Because of the suggestions of Vorhees, Padula, and others, and since community college students attend in much the same fashion as one would use a library (Adelman, 1992), the traditional definition of persistence, attending until a degree is obtained, should be modified to more adequately reflect community college student attendance behavior. Traditional persistence indicators such as continuous reenrollment may be the wrong indicator to use in persistence research. Another indicator used wrongly for community college students in a persistence definition is withdrawal behavior. Withdrawing or leaving a community college may indicate that the student transferred to another institution rather than leaving higher education altogether. "Clearly, there may be no ideal solution to the problems in defining

persistence in postsecondary education. Any single definition of persistence/ withdrawal is unlikely to be completely satisfactory." (Pascarella, Smart, and Ethington, 1986; p. 54)

Several alternative indicators can be considered as a substitute for the traditional persistence indicator. As an alternative, course completion could easily be used as a indicator of persistence and course completion rate as an indicator of progressing toward goal-attainment. Because some community college students attend to update current skills or to become current in their field, completion of only a few courses may be needed to attain either of these goals. For these students, course completion may indicate either their goal-attainment or progress toward goal-attainment (persistence).

The last alternative considered is to use goal-attainment as an indicator of the successful termination of going to college in lieu of degree completion, and as long as a student is pursuing that goal, whether or not the student stops-out or continuously enrolls, s/he is considered to be persisting. This alternative definition of persistence is the one that will be used in this study. A time-frame could be included, but for the purposes of this study, since it will be a cross-sectional study and not longitudinal, setting a time-frame would be moot. With this definition of community college student persistence, the traditional indicator used to terminate a student's persistence pattern

shifts from degree-completion to goal-attainment.

Terenzini and Wright (1987) touched on this relationship between goal-commitment and persistence, although they were still tied to the degree-seeking-student syndrome.

> While this study included as a background (and exogenous) variable students' goals with regard to the highest degree expected, the failure here to include measures of students' commitments to achieving other academic and career/vocational goals is more problematic. These commitments might well be expected to influence for example, the amount of effort a student exerts, which, in turn, is likely to affect the level of that student's academic (and possibly social) integration. (p. 166)

Vorhees (1987) suggested that the college experiences a student incurs while in attendance, are very important in any discussion of student persistence. How a student perceives the relationship between the institution and themselves is part of a general sense of satisfaction with his or her college experiences. The more satisfied a student is with his or her college experiences, the better the college/student relationship and the more likely the student will persist. As students perceive that their goals are being met because of their college experiences, the more satisfied they become and the more likely they will persist to goal-attainment. Hearn (1985) studied the relationships between students' satisfaction, performance, and persistence.

He found that student satisfaction is a determinant of academic performance which in Tinto's model influenced persistence. Hearn advanced this notion in support of other researchers (Bean and Bradley, 1984) who also concluded that satisfaction influences among other behaviors, student persistence.

Goal commitment, as shown, is an important factor in the study of student persistence. Similar to the treatment of community college student persistence by researchers, goal commitment has been approached from a narrow research perspective as Grosset (1989) points out: "Student goal commitment has generally been narrowly operationalized by degree aspiration information." (p.25) This is another example of a construct which has been influenced by the traditional degree-seeking mind-set. Another twist on this construct is the differentiation between a student's institutional commitment and a student's goal commitment. Goal commitment in this study is based on the student's reasons for attending, which are the intent to, transfer, obtain skills for a new job, obtain skills to remain current, attend because of a personal interest, or improving current English skills. These five possibilities determine the five goal-commitment groups for this study.

Grosset (1989) collected data on the students who attended the community college where she was employed and found that a goal-commitment rubric similar to the one above was more characteristic of community college student behavior

than degree completion. "Student self-reported assessments of goal completion indicated that a large percentage of 'dropouts' actually completed their objectives, despite not earning a degree." (Grosset, 1989; p. 28)

Pascarella and Terenzini (1980) studied student peristence at Syracuse University, and reported results similar to Grosset's. One of the constructs used in their study consisted of a student's perception of gains or progress on such items as intellectual and personal development and academic experiences. They concluded that a student's perception of making progress on these types of items seems to influence persistence behavior.

Significance of the Study

Vorhees (1987) and others such as Pascarella, Smart, and Ethington (1987) complain of the dearth of meaningful persistence research using community college students as subjects. This study, however, focuses on one community college in southeast Texas and will add to the body of literature helping to alleviate this problem. However, for this study a different approach will be taken. Since the traditional persistence definition does not seem to be very useful for community college persistence research, and the models described to this juncture do not adequately describe community college persistence behavior, this research will operate under the premise that investigating the relationship between goal commitment (reason for attending) and the student's perception of gains on twenty-three general

educational goals is a precursor to the development and testing of a persistence model for community colleges.

Community college students leave an institution (withdraw, attrite, dropout, stop-out) for a variety of reasons, some of which mirror the reasons students leave four-year institutions. However, the profile of the community college student is quite different than the profile of the four-year college student (Adelman, 1992: Vorhees, 1987: Bean, 1981). This profile suggests that a different set of criteria may apply to the two-year-college student persister and/or leaver. The approach taken by this researcher was to examine two variables of community college student persistence, using the definition of student persistence as proposed in this study, within the context of this profile, lending support to the notion that a community college student persistence paradigm is needed.

> Throughout the eighteenth century those scientists who tried to derive the observed motion of the moon from Newton's law of motion and gravitation consistently failed to do so. As a result, some of them suggested replacing the inverse square law with a law that deviated from it at small distances . . . . In the event, . . . one of them discovered how they could successfully be applied. Only a change in the rules of the game could have provided an alternative. (Kuhn, 1970; p. 41)

The significance of this study is to add to the impetus

advanced by Vorhees, Padula, Bean and others that the study of community college student persistence needs new approaches. Investigating variables and relationships that this researcher considers a part of the community college student persistence issue is one such approach. As Vorhees (1987) mentioned, conceptualizing a model is necessary and to examine relationships such as those in this study is an important step in developing the necessary research to underpin the process of conceptualizing a student persistence model for community colleges.

Problem Statement

The two variables of goal commitment, consisting of five groups of students, and the student's perception of estimated gains on attaining twenty-three general educational goals consisting of six dimensions, will be the focus of this study. The problem is to examine the relationship between the student's goal commitment and the student's perception of gains. In order to determine which groups have perceptions of gains which are different than the other groups, the difference between the five goal-commitment groups on the six dimensions of the student's perception of gains variable will also be examined. How the results of this study will be used in the development of a community college persistence model is left for further research but this study was an attempt to provide information needed to develop a conceptual model of community college student persistence.

Purpose of the Study

Because the components of a full community college persistence model are too numerous to be investigated within the scope of this study, a more modest approach was taken. This study examined two variables that previous researchers suggested applicable in explaining college student persistence to either confirm or eliminate those variables in a community college environment.

The purpose of this study was to examine the relationship between community college student goal commitment and the student's perception of gains which were measured by the Community College Student Experiences Questionnaire (CCSEQ) using students attending a southeast Texas community college as subjects.

Definitions

The goal commitment variable was used as a categorical variable to separate the sample into five groups and will be the independent variable for the study. The question which was used to determine goal commitment asks "What is the most important reason you are attending THIS college at this time?" The possible responses to this item are: (1) "To prepare to transfer to a four-year college or university," (2) "To gain skills necessary to enter a new job or occupation," (3) "To gain skills necessary to retrain, remain current, or advance in a current job or occupation," (4) "To satisfy a personal interest," and (5) "To improve my English, reading, or math skills." These responses are representative

of the diverse reasons given by community college students for attending.

Persistence has been defined as attending a community college in order to attain one of the goals listed above. The student's perception of gains on twenty-three general educational goals because of his or her college experiences while attending is an important component of persistence behavior. The student's perception of gains was measured by the "Estimate of Gains" section of the CCSEQ. This section begins with the statement, "In thinking over your experiences in this college up to now, to what extent do you think you have gained or made progress in each of the following areas?" The respondent was requested to mark one of the following possibilities to each of the twenty-three statements listed in this section: (1) Very little, (2) Some, (3) Quite a bit, or (4) Very much. These responses are treated as a Likert scale with "Very little" assigned a value of one, "Some" assigned a value of two, "Quite a bit" assigned a value of three, and "Very much" assigned a value of four. The twenty-three statements in this section was used to measure the six dimensions of the students perceptions of gains variable. The scale score for each dimension was found by summing the values of the responses to each of the itmes assigned to it. These six dimensions or scales were established by the authors of the CCSEQ who used a factor analysis on the data collected from over 7,500 respondents. The factor analysis of these data resulted in the following

dimensions: (1) Career Preparation, (2) Arts, (3) Communication Skills, (4) Mathematics, Science, and Technology, (5) Personal and Social Development, and (6) Perspectives of the World.

Research Question

The first research question was: What is the relationship between a student's goal commitment and his or her perception of gains, as measured by the CCSEQ, for community college students enrolled in a southeast Texas community college?

A second research question was: What are the differences between the goal-commitment groups on the six dimensions of their perception of gains?

Research Hypotheses

Hypothesis number one was: There is a difference between the goal-commitment groups on the six dimensions of the perception of gains construct.

The second research question generated as a hypothesis, a set of a priori contrasts suggested by Grosset (1989) which compared the differences between the goal-commitment groups on each of the six scales of the student's perception of gains. The second hypothesis was: There is a greater difference between the transfer group and the four other goal-commitment groups on the six dimensions of their perceptions of gains. That is; the transfer group will report greater perceptions of gains on the six dimensions than the other four goal-commitment groups.

Methodology

Students enrolled in a single community college in southeast Texas during the Spring Semester of 1992 were used as subjects for this study which examined the differences between the five goal-commitment groups, which were determined by the subject's reason for attending this particular college and the subject's perception of gains construct. The gains construct, which consists of six dimensions, was measured by the twenty-three statements in the "Estimate of Gains" section of the Community College Student Experiences Questionnaire (CCSEQ). A factor analysis of the data collected by the authors of the CCSEQ determined the six dimensions. Each of these dimensions was then treated as a Likert-type scale.

Design

The six dependent variables examined in this study represented six dimensions of the student's perception of gains construct. The authors of the CCSEQ derived these six dimensions by factor analyzing the data gathered from over 7,500 returned questionnaires representing students from twenty-four community colleges. These dimensions of the student's perception of gains were: (1) Career Preparation, (2) Arts, (3) Communication Skills, (4) Mathematics, Science, and Technology, (5) Personal and Social Development, and (6) Perspectives of the World.

Table 1 lists the factor loadings, as reported in the CCSEQ manual, for each of the statements used in the

"Estimate of Gains" section of the CCSEQ, grouped by dimension. The possible responses for each of the student's perception-off gains statements were: (1) Very Little, (2) Some, (3) Quite a Bit, and (4) Very Much. Using a Likert-scaling technique of the "Estimate of Gains" statements, the value assigned to each response ranged from 1

Table 1

Factors and Factor Loadings for the Dependent Variables

Factors	Gain Statement	Factor Loadings
Career Preparation		
	Acquiring knowledge and skills applicable to a specific job or type of work	.62
	Gaining information about career opportunities.	.85
	Developing clearer career goals	.76
	Becoming acquainted with different fields of knowledge	.43
Arts		
	Developing an understanding and enjoyment of art, music, and theater	.70
	Developing an understanding and enjoyment of literature (novels, stories, essays, poetry, etc.)	.63

Table 1 (continued)

Factors and Factor Loadings for the Dependent Variables

Factors	Gain Statement	Factor Loadings
Communication Skills		
	Writing clearly and effectively	.79
	Presenting ideas and information effectively in speaking to others	.51
Mathematics, Science, Technology		
	Acquiring the ability to use computers	.24
	Understanding mathematical concepts such as probabilities, proportions, etc.	.64
	Understanding the role of science and technology in society	.67
	Putting ideas together to see relationships similarities, and differences between ideas	.40
	Interpreting information in graphs and charts I see in newspapers, textbooks, and on TV	.39

Table 1 (continued)

Factors and Factor Loadings for the Dependent Variables

Factors	Gain Statement	Factor Loadings
Personal and Social Development		
	Becoming aware of different philosophies, cultures, and ways of life	.45
	Becoming clearer about my own values and beliefs	.78
	Understanding myself - my abilities and interests	.70
	Developing the ability to learn on my own, pursue ideas, and find information	.36
	Understanding other people and the ability to get along with different kinds of people	.44
	Developing good health habits and physical fitness	.26
Perspectives of the World		
	Developing the ability to speak and understand another language	.33
	Developing an interest in political and economic events	.64
	Seeing the importance of history for understanding the present as well as the past	.71
	Learning more about other parts of the world and other people	.71

for a "Very Little" response to 4 for a "Very Much" response. The respondent's score for each dimension was found by summing the value assigned to each of his or her responses to the gains statements for that dimension. For example, a subject's score on the dimension "Career Preparation" was found by summing the values assigned to the subject's responses to gains statements one, two, three, and four in the "Estimate of Gains" section of the CCSEQ. The range of possible scores for the dependent variables were: (1) Career Preparation: 4 - 16, (2) Arts: 2 - 8, (3) Communication Skills: 2 - 8, (4) Mathematics, Science, Technology: 5 - 20, (5) Personal and Social Development: 6 - 24, and (6) Perspectives of the World: 4 - 16. The scales were constructed so that the higher the score, the more progress the student would have perceived.

The independent variable for the study was goal commitment, used as a categorical variable, consisting of five groups of subjects. The subject's response to the question, "What is the most important reason you are attending THIS college at this time?", determined to which one of the five goal-commitment groups the subject was assigned. The five possible responses to this question were: (1) "To prepare to transfer to a four-year college or university," (2) "To gain skills necessary to enter a new job or occupation," (3) "To gain skills necessary to retrain, remain current, or advance in a current job or occupation," (4) "To satisfy a personal interest," and (5) "To improve my

English, reading, or math skills." Because only one point-in-time measurement of the dependent variables was collected for these groups, the design was cross-sectional.

The research questions were:

(1) What is the relationship between a student's goal commitment and his or her perception of gains, as measured by the CCSEQ, for community college students enrolled in a southeast Texas community college?

(2) What are the differences between the goal-commitment groups with respect to the six dimensions of their perceptions of gains?

Population and Sample

The population for this study included all the students who were enrolled in a southeastern Texas community college during the Spring Semester, 1992. The population included approximately 3,200 students from an area that is heavily industrialized, mainly by chemical companies. The decision to use only one community college in the study was based on cost and convenience to the researcher. The basis for this decision did not differ from many of the persistence studies examined by this researcher. The use of only one community college compromised the generalizability of the results to other community colleges. However, as stated earlier, community colleges are, or should be, unique to the community they serve, and because of this uniqueness, generalizability of the results to other community colleges may be a moot

point anyway.

Since this researcher was obligated to use classes as the basis for administering the questionnaire, representativeness of the population was a concern. Community college students are considered nontraditional, so the intent was to select a sample which represented the population with respect to several characteristics. The characteristics used for testing representativeness of the sample to the population were gender, ethnicity, age, the time period for the preponderance of the student's classes (day, night, or both), and full-time/part-time status. A student was considered a full-time student if s/he was enrolled in at least twelve semester credit hours during the semester.

A sample of classes was selected by a computerized random selection process, then a chi-square goodness-of-fit test was used to determine the sample's representativeness for each of the characteristics listed above. If the chi-square test showed that the sample drawn was not representative, a new random sample was drawn using the same computerized random selection process. Using this process of selection, a sample of classes was selected. The students enrolled in those classes represented the population with respect to the characteristics listed above, and the questionnaire was administered to that group.

After the first administration of the questionnaire, an analysis was done in an attempt to determine the actual

proportion of each characteristic with respect to the sample. This process proved to be untenable. Out of the approximately 550 questionnaires delivered to faculty members for administration, over 200 were returned uncompleted. As a result, a second random sample of classes was selected using the same computerized randomized selection process described above. It was necessary to follow this process a third time. After these three separate administrations of the questionnaire were done, the goal of obtaining 500 completed questionnaires was attained.

One restriction was imposed upon the study. The questionnaire had to be administered to the entire class so that as few classes as possible would be interrupted. This restriction meant that classes was the only stratum used in the sampling process. If more strata had been included, each of the strata would have had to have a sample drawn from it (Kalton, 1983). Even though this restriction was imposed, and problems were encountered during the three administrations of the questionnaire, 510 questionnaires were returned for analysis.

A class roll was given with each set of questionnaires with instructions to the faculty asking them to mark the names of those students who did not complete the questionnaire. Some of the class rolls were not marked, and some were not returned.

One other problem which arose, also emanated from the lack of cooperation by the faculty. Some of the classes

chosen were not given the questionnaire because faculty chose not to administer it. Several of the questionnaires were "lost." One excuse given was that the entire class had already responded to the questionnaire. The most frustrating problem was the number of withdrawals and absences, in some cases over fifty percent, which accounted for many of the questionnaires' not being completed.

These problems contributed to the non-representativeness of the sample. Table 2 gives the results of using a chi-square goodness-of-fit test for each characteristic of the sample to test the sample for representativeness of the population. The results in Table 2 were quite disappointing, but the sampling bias which resulted, if any, was not examined. After the chi-square analysis for goodness-of-fit,

Table 2

Results of the Goodness-of-Fit Tests

Subpopulation	Chi-Square	Degrees of Freedom	p	Representative?
Gender	15.687	1	< 0.001	No
Ethnicity	9.965	5	0.076	Yes
Part/Full Time	34.079	1	< 0.001	No
Age	87.643	5	< 0.001	No
Day/Night/Both	83.048	2	< 0.001	No

shown in Table 2, ethnicity was the only characteristic that proved to be representative of the population.

Instrument

The instrument used in this study was the Community College Student Experiences Questionnaire (CCSEQ), as developed by the Center for the Study of Evaluation, Los Angeles, California. Dr. C. Robert Pace, who has been active in questionnaire development of this type for a number of years, headed the development of the CCSEQ and was assisted by Dr. Jack Friedlander and Dr. Penny Lehmann. Prior to the CCSEQ, Dr. Pace developed the College Student Experience Questionnaire (CSEQ), an instrument that is similar to the CCSEQ and has been administered to over 25,000 four-year college students (Pace, 1990).

Reliabilities for the Quality of Effort scales, as reported in the CCSEQ Manual, are displayed in Table 3. These scales are Likert-type scales developed from the various activities sections on the CCSEQ. As shown in Table 3, the reliabilities were quite good for all these activity scales. The reliabilities of the scales were also calculated using the data collected from this study which are also reported in Table 3, and closely corresponded to the ones given in the CCSEQ manual. The item-scale correlations are also given in the test manual and upon, examination, suggest that the activity items measured were valid. Even though

Table 3

College Activities Scales: Estimates of Reliabilities

Scale	Cronbach's alpha CCSEQ Manual	Cronbach's Alpha This Study
Course Activities	.85	.84
Library Activities	.87	.88
Faculty	.86	.80
Student Acquaintances	.89	.87
Art, Music, and Theater	.83	.75
Writing Activities	.87	.93
Science Activities	.93	.93
Vocational Skills	.94	.95

these items were not used in the study, should the questionnaire's credibility be questioned, the inclusion of this information would be very helpful in alleviating this concern.

Data Collection Procedure

The data were collected from the administration of the CCSEQ to the subjects selected for the study, as explained above. The completed questionnaires were sent to the Center for the Study of Evaluation, Los Angeles, California, for scanning. Once scanned, the data were returned on diskette for analysis. The data were transferred from the diskette to a Digital Equipment Corporation VAX 3400 for analysis using

SPSS-X, version 4.0.

The administration of the questionnaires was done as prescribed by the Human Subjects Committee, University of Houston. The questionnaire had a cover letter describing to the subject the methods to be used in responding to the questionnaire and how the subject was to return the completed questionnaire to insure confidentiality.

Data Analysis Procedures

In order to compare the results presented in the test manual with the data obtained from the study, a factor analysis was done on the estimate of gains responses. Cronbach's alpha was also calculated on the scales, as defined, so that the factors obtained in the study could be compared with the results presented in the CCSEQ user's manual.

The factor analysis on the data collected resulted in five factors rather than six, as reported in the CCSEQ manual. The "oblimin" rotation was used because this was the method used to determine the six factors reported in the CCSEQ manual. Cronbach's alpha was calculated for the six factors. These reliabilities ranged from .76 for factor one (Career Preparation) to .56 for factor two (Arts and Humanities). In fact, the reliability of only two factors (Career Preparation and Personal and Social Development) exceeded the recommended .70 floor. These results suggested that the sample used for this study was not similar to the sample reported in the CCSEQ manual. Two reasons that may

explain these discrepancies are: (1) the sample did not meet the representativeness criteria established for this study, and (2) the uniqueness of community colleges and the nontraditional profile of their students may indicate that one should not expect congruity between the results reported in the CCSEQ manual and other community colleges.

An example of the incongruity between the community colleges used in the CCSEQ manual and the one in this study was the gender characteristic. The proportion of males reported in the CCSEQ manual was 43% male, whereas for the community college used in this study the proportion of males was 50%. Another example of incongruity was ethnicity. For the population used in this study, 77.5% of the population was white, whereas for the sample in the CCSEQ manual, the proportion of white students was 61%. The differences in the profile of the two sets of subjects may account, at least in part, for the differences found in the results of the factor analysis as well as the reliabilities between the sample used in this study and the CCSEQ manual.

Even though the factor analysis of the data used for this study was not expected to mirror the results reported in the CCSEQ manual, more congruity between the two sets of results was expected. The factors reported in the CCSEQ manual were used in this study rather than those obtained from doing the factor analysis on the data collected for this study. This factor analysis was conducted for comparative purposes and to provide more information about the data

collected. The researcher had no intention of replacing those factors set forth in the CCSEQ manual.

In addition to factor analysis, multivariate analysis was used because multivariate analysis is designed to examine several dependent variables simultaneously, as a system. The results of a multivariate analysis indicate whether or not there is a difference between goal-commitment groups with respect to the set of dependent variables. Because this study consisted of six dependent variables, and because the research questions asked about the system of variables, multivariate analysis was used. Multivariate analysis was also used because this type of analysis provides a more complete and detailed description of the phenomena being studied (Stevens, 1986). Multivariate analysis takes into account the correlation that may exist between the dependent variables, which is not done in the univariate-only (or ANOVA) analysis, which makes the multivariate analysis more powerful than the univariate-only method (Stevens, 1986: Bray and Maxwell, 1990). Even though these reasons provided justification for using multivariate analysis, several concerns about using this methodology were also considered.

One concern arises from using several types of significance tests in the same study, such as using multiple t-tests. The level of protection provided by the nominal level of significance (alpha = .05) could be inflated using multiple significance tests on the same set of data. An experimentwise protection for the .05 level of significance

for subsequent univariate tests was desired. An alternative to this approach would have been to use a Bonferroni or other procedure to distribute the alpha across the various follow-up tests. Bray and Maxwell (1982) addressed this issue stating that "the term 'protected' comes from the idea that the overall multivariate test provides protection from an inflated alpha level on the p univariate tests" (p. 341). Stevens (1986) offers a conciliatory strategy for the researcher wishing to resolve this dilemma: "In an exploratory study, testing each variable for significance at the .05 level, after a significant multivariate result, is a reasonable procedure" (p. 143). Bray and Maxwell concur with Stevens' suggestion.

The experimentwise level of significance for this study was set at .05 and was used for the overall multivariate test. Since the result of this test was statistically significant, univariate F-tests followed. As suggested by Stevens (1986), the significance level for each of the univariate F-tests was also set at .05.

The multivariate technique (MANOVA) provided analysis on the set of dependent variables, taking into account the correlations between them and indicated that there were group differences, but not which group differed significantly on which dependent variable. The univariate F-tests provided information that the groups differed with respect to the dependent variables but did not take into account correlations between the dependent variables. The univariate

tests did not indicate which groups differed significantly on any of the dependent variables. In order to resolve this predicament, two additional statistical methods available to the researcher for additional analysis were: (1) contrasts, either planned (a priori) or post hoc, and (2) discriminant analysis.

The first of these, planned contrasts, was used to analyze the data more parsimoniously. An a priori contrast was chosen so that the experimentwise significance level (alpha = .05) could be used as the level of significance for the contrasts. The a priori contrast chosen for this study was the "simple" contrast as provided in the MANOVA procedure section of SPSS-X. Grosset (1989) suggested the a priori contrast used for this study: "Research has indicated that the more likely a student is to possess a transfer goal or the less definite they are about their satisfaction with the college or their intentions, the less likely they will be [to] persist" (p. 25). This set of contrasts compared the transfer group (Reason 1) with the other four groups on the six dimensions of the student's perceptions of gains. These contrasts indicated whether or not the transfer group had significantly greater estimate-of-gains scores than the other groups on each dimension.

The other statistical analysis available to the researcher was discriminant analysis. The reason for using discriminant analysis was explained by Stevens (1986).

Discriminant analysis has two very nice features:

> (1) parsimony of description, and (2) clarity of interpretation. It can be quite parsimonious in that in comparing 5 groups on say 10 variables, we may find that the groups differ mainly on only two major dimensions, i.e., the discriminant functions. It has a clarity of interpretation in the sense that separation of the groups along one function is unrelated to separation along a different function. This is all fine provided we can meaningfully name the discriminant functions and that there is adequate sample size so that the results are generalizable. (p. 232)

The usefulness of this technique was also explained by Bray and Maxwell (1982).

> Discriminant analysis provides more sophisticated and complex analysis of the data than does the univariate approach. However, this complexity can be a drawback to the use of discriminant analysis, particularly when there are multiple significant discriminant functions. The underlying dimensionality of the variables, the relationship of the variables to the underlying dimensions, and the interrelationships among the variables are all considered in the discriminant analysis. In contrast, the univariate approach simply provides the individual effects of each variable, ignoring all other variables. Inspecting the univariate F ratios along with the discriminant coefficients and canonical variate correlations will often provide useful

information for interpreting the unique and common contribution of each variable. (p. 347)

As useful as discriminant analysis seems, this technique has the following two limitations: (1) results are not likely to be replicated with different data sets, and (2) since the analysis uses the data to factor out different functions repetitively, there is a tendency for capitalization on chance. After weighing both its advantages and limitations, discriminant analysis was done for two primary reasons: (1) its explanatory power of helping the researcher describe the major differences among groups, and (2) its method of classifying subjects into groups based on the dependent variables (Stevens, 1986: Bray and Maxwell, 1980).

The results of the discriminant analysis included standardized discriminant function coefficients which reflect the unique contribution of any dependent variable over and above that of the remaining variables. The standardized structure coefficients indicate a variable's contribution to the calculation of the discriminant score. Caution has to be taken by the researcher in the interpretation of these coefficients as "each take into consideration the simultaneous contribution of all the other variables" (Klecka, 1980, p. 83). The discriminant function-variable correlations, which are the correlations between each of the discriminant functions and the original variables, were also used. These coefficients are also referred to as the total structure coefficients (Stevens, 1986: Daniel, 1990). These

coefficients help name the discriminant functions in that high correlations indicate that the variable and the discriminant function are measuring similar characteristics.

As suggested by Stevens (1986), both the standardized coefficients and the discriminant function-variable correlations were used to interpret the discriminant functions and to group differences on the dependent variables. As an added confirmation, the analysis included results on how well the subjects were classified by the dependent variables.

Analyses Overview

This system of dependent and independent variables was investigated using two multivariate analysis methods. The multivariate analysis of variance (MANOVA) showed that the first research hypothesis was tenable because there was a significant difference between the goal-commitment groups with respect to the six dimensions of the dependent variable. Further investigation suggested there was also a significant difference between the goal-commitment groups and the six dimensions of the student's perceptions of gains construct. The interpretation of these results led to the use of univariate tests to determine all the significant differences between the goal-commitment groups on each of the dependent variables. Even though each of these six univariate tests was statistically significant which indicated group differences existed, these tests did not point out which goal-commitment group was significantly different from

another on each of the dependent variables.

A priori contrasts were used to examine the above differences in more detail. The assumption that the preparing-for-transfer goal-commitment, which was more strategic than the other goal commitments, guided the choice of using the transfer group as the basis for the contrasts. The results of all but five of these contrasts showed that there was a significant difference between the transfer group and the other four goal-commitment groups on each of the dependent variables. These significant contrasts supported the notion that the more strategic the goal-commitment, the more progress the student would perceive s/he made with respect to the general education goals.

Discriminant analysis was the other multivariate analysis technique used to investigate the data. The discriminant functions did not seem to classify the groups very well, which suggested that the dependent variables were not good predictors of group membership. The results of this analysis did, however, suggest that the six dependent variables may be measuring two latent variables which were the first two discriminant functions in the analysis.

Before these analyses are discussed in detail, an explanation of the multivariate analysis assumptions is included.

Validation of the Multivariate Analysis Assumptions

When using a multivariate analysis method, several assumptions must be validated. These assumptions are:

(1) independence of the subjects' responses, (2) multivariate normality, and (3) homogeneity of the covariance matrices. The independence-of-responses assumption was addressed by instructing the subjects to respond to the CCSEQ individually therefore violation of the independence-of-responses assumption was not a concern of this researcher. According to Stevens (1986), "Whenever the treatment is individually administered, observations are independent" (p. 203). Multivariate normality and homogeneity of covariance matrices are closely related in that violation of the homogeneity-of-covariance-matrices assumption may directly result from a violation of the multivariate-normality assumption.

The significance test used to examine the homogeneity-of-covariance-matrices assumption was "Box's M" test, which was significant ($M = 119.18$, $p < .05$). This test is very sensitive to non-normality of the multivariate data (Stevens, 1986). Bray and Maxwell (1990) agreed: "Although a test of homogeneity of covariance matrices is widely available (Box's M), this test is generally not useful [emphasis mine] because the test itself is extremely sensitive to departures from normality" (p. 34). This impasse seemingly could have been resolved by examining multivariate normality for the data collected; however, the outcome of the examination became a complex process with mixed results.

A single significance test for multivariate normality was not available. Instead, Stevens (1986) suggested two processes to use in an investigation of multivariate

normality. These processes were: (1) use of Mahalanobis' distances for a graphing procedure which would indicate normality (explained in Stevens (1986), pages 207 through 212), and (2) examination of several univariate statistics for each group on each dependent variable. There were 510 responses for which to find Mahalanobis' distances; therefore, using these distances in a complex procedure to construct a graph seemed to be an untenable strategy. The second suggestion of using univariate statistics to show multivariate normality was the approach taken by this researcher.

The first univariate analysis used was the examination of the "generalized variances" for each of the five groups. These variances were the multivariate measures of within-group variability for the goal-commitment variables

Table 4

Generalized Variances for Goal-Commitment Groups

Goal-Commitment Group	Group Size	Generalized Variance
1. Prepare for transfer	213	5081.73
2. Gain skills for new job	166	2192.66
3. Gain skills to remain current or advance	81	1253.77
4. Satisfy a personal interest	30	4230.96
5. Improve basic skills	6	N/A

(Table 4). In the simplest interpretation of this strategy, if the largest generalized group-variance was associated with the largest group-size, the multivariate test (Box's M) would have been conservative, and the significance reported would have been too small. If, on the other hand, the smallest group-size had the largest generalized variance, the multivariate test would have been liberal, and the significance would have been too large. The pattern of large variance with large group-size was not consistent for every pair of goal-commitment groups. The largest variance (5081.73) was associated with the group with the largest group-size (n = 213). Group five (students who were attending to improve basic skills) had a very small group-size (n = 6) but a very large generalized variance (4230.96). Group four had a small group-size (n = 30) but a relatively large generalized variance (4230.96). However, when comparing groups one through four in pairs, the small-size/large-variance relationship was valid. This situation was quite similar to an example explained by Stevens (1986), who concluded, "the effect of heterogeneity should not be serious, since the literal and conservative tendencies co-existing [sic] should have a somewhat cancelling out effect" (p. 228). Even though the small group-size of the improve-basic-skills group may have had a mitigating effect on multivariate normality, the cancelling-out effect described above, was considered a reasonable conclusion for this study.

Table 5

Kurtosis Coefficients of the Dependent Variables by Goal-Commitment Group

Dependent Variables	Kurtosis Coefficients for Goal-Commitment Groups				
	1 (n=203)	2 (n=156)	3 (n=72)	4 (n=30)	5 (n=6)
1. Career Preparation	.44	-.56	-.31	-.33	-1.56*
2. Arts	.00	.80	.65	-.59	-.30
3. Communication Skills	-.58	-.63	.04	-.19	3.96*
4. Mathematics, Science, Technology	-.58	.16	.18	-1.01	1.78*
5. Personal and Social Development	-.72	-.27	-.72	-.32	-2.15*
6. Perspectives of the World	-.43	3.12*	.43	.06	2.91*

*= Significant Kurtosis

Legend for Group:
1. Prepare for transfer
2. Stay current or advance in job
3. Obtain new skills for new job
4. Personal interest
5. Improve basic Skills

Note: The formulae for testing significance of the kurtosis coefficients were given in Stevens (1986), page 215.

Another procedure used to examine univariate normality was the inspection of each group on each dependent variable. The two statistics which could have been used for testing univariate normality, were kurtosis and skewness. Because platykurtosis (flatness) has the effect of reducing statistical power, kurtosis was the more important statistic to use. Except for group five (attending to increase basic skills), most of the kurtosis statistics (Table 5) were not significant. This group had such a small group-size, (n=6), the non-normality results were not surprising. The analysis of the kurtosis coefficients suggested that, for the most part, the data were multivariate normal.

The various univariate tests used as surrogates for testing multivariate normality yielded mixed results. However, MANOVA is robust with respect to violations of the multivariate-normality assumption. The results of this study are presented within the context of these significance tests, trusting the robustness of the MANOVA procedure to hurdle any bias which may have been introduced because of violations of the multivariate-normality assumption.

The cause for the significance of Box's M (used for testing homogeneity of covariance matrices) was considered, in part, a result of the small group-size associated with the basic-skills group. Another reason may have been the non-representativeness of the sample, as explained earlier.

MANOVA Results

After the assumptions were examined, the overall

multivariate test (MANOVA) was performed as the first stage in the systematic process of answering the research questions. The first step in this investigation was determining the significance of the system of dependent variables and five goal-commitment groups. The multivariate test was statistically significant (Wilk's lambda = .677, $p < .05$). This result suggested that hypothesis one was tenable, and there was a statistically-significant difference between the five goal-commitment groups with respect to the six dimensions of the student's perception of gains construct.

Univariate Results

Since the overall multivariate test was significant, univariate tests were conducted which examined the

Table 6

Univariate F Tests on the Five Goal Commitment Groups

Goal-Commitment Group	F value (DF = 4,462)	p
Career Preparation	8.99	< .001
Arts	19.38	< .001
Communication Skills	8.48	< .001
Mathematics, Science, Technology	6.17	< .001
Personal and Social Development	4.13	.003
Perspectives of the World	16.30	< .001

differences between each of the goal-commitment groups with respect to the six dimensions of the dependent variable. Each of these tests was statistically significant, as shown in Table 6.

These significant univariate F-tests suggested that for each of the goal-commitment groups there was a significant difference at the same level of significance (Stevens, 1986), between at least one pair of the six dimensions of the student's perception of gains construct at the same level of significance (Stevens, 1986). There was no guarantee as to which variable-pair would be significant, nor indication of the linear combination of the variables needed for the contrast.

Results of the A Priori Contrasts

The final analysis of the data for this multivariate analysis (MANOVA) compared the transfer group to each of the other four groups on each of the dependent variables. The second research hypothesis, which included the a priori contrasts, conjectured that the transfer group would have greater perceptions of gain scores for each of the dependent variables than the other four groups. These contrasts used the averages (Table 7) of each group on each of the dependent variables to test for significance. The contrasts tested whether or not the means for the transfer group on the six dependent variables was greater than any of the means for the remaining four goal-commitment groups. The results of these contrasts are presented in Table 8.

Table 7

Averages, Expressed as Standard Scores, of the Dependent Variables by Goal-Commitment Group

Goal-Commitment Group	Perception of Gains Variables					
	1	2	3	4	5	6
Prepare for transfer	0.10	0.38	0.23	0.18	0.16	0.38
Skills for a new job	0.23	-0.31	-0.02	0.02	-0.03	-0.33
Stay current or advance in job	0.13	-0.50	-0.42	-0.31	-0.21	-0.31
Personal interest	-0.52	0.44	-0.21	-0.43	-0.33	0.06
Basic skills	-1.52	-0.45	-0.87	-0.77	-0.54	-0.46

Legend for Gains Variables:

1. Career Preparation
2. Arts
3. Communication Skills
4. Mathematics, Science, Technology
5. Personal and Social Development
6. Perspectives of the World

Upon examination of the significance tests for the contrasts, there were five (out of 24 separate tests!) non-significant results (the averages used for this discussion are the actual averages, rather than the standard scores): (1) the difference (.16) between the averages for the transfer

Table 8

Significance Tests for Contrasts

Dep. Var.	Contrast Number 1		2		3		4	
	F	p	F	p	F	p	F	p
1	9.79	.002	3.31	.069*	5.20	.023	12.68	< .001
2	47.86	< .001	44.83	< .001	0.12	.727*	4.61	.032
3	6.99	.008	26.45	< .001	5.66	.018	7.60	.006
4	3.00	.084*	14.71	< .001	10.09	.002	5.46	.020
5	4.09	.044	10.09	.002	6.82	.009	3.03	.082*
6	51.31	< .001	32.72	.002	3.15	.077*	4.72	.030

* = non-significant result

Multivariate Tests using Wilk's lambda (WL)

WL	.811	.847	.962	.961
	p < .05	p <.05	p < .05	p < .05

Legend for Dep(endent) Var(iables):

1. Career Preparation
2. Arts
3. Communication Skills
4. Mathematics, Science Technology
5. Personal and Social Development
6. Perspectives of the World

Table 8 (continued)

Significance Tests for Contrasts

Legend for Contrasts:

The goal-commitment group attending to prepare for transfer is compared with each of the others:

1. Transfer vs. Skills for a new job
2. Transfer vs. Stay current or advance
3. Transfer vs. Personal interest
4. Transfer vs. Improve basic skills

Note: F = F value

group (.18) and the skills-for-a-new-job group (.02) on the Mathematics, Science, and Technology dimension, (2) the difference (-.03) between the averages for the transfer group (.10) and the stay-current-or-advance group (.13) on the Career Preparation dimension, (3) the difference (-.06) between the averages for the transfer group (.38) and the personal-interest group (.44) on the Arts dimension, (4) the difference (.32) between the averages for the transfer group (.38) and the personal-interest group (.06) on the Perspectives of the World dimension, and (5) the difference (.70) between the averages for the transfer group (.16) and the basic skills group (-.54) on the Personal and Social Development dimension. These non-significant results, three of which included the personal-interest group or the basic-skills group, suggested that the two groups did not differ in

their perceptions of gains on the twenty-three general education goals. There was a large group-size difference between these groups. These results were not counter-intuitive as the groups with the small group-size had a relatively large generalized variance. This large difference in group-sizes may account for the non-significant F-tests. In fact, there was a generous preponderance of significant F-tests, considering that the basic-skills group had such a small group-size.

One of the other two non-significant results (transfer group versus skills-for-new-job group on the Mathematics, Science, and Technology dimension) indicated that the perception of progress on this dependent variable was the same for both groups. This may have been precipitated by the course demands since both groups were, in essence, acquiring new skills which included an emphasis in at least one of the areas of mathematics, science, or technology.

The last non-significant contrast, comparing the transfer group to the stay-current group on the Career Perspectives dimension, was not surprising and should have been predicted. Both groups should be concerned with a "career path" and, intuitively, should have overlap on this dimension.

In all but five of the contrasts, the results suggested that the group who prepared for transfer perceived they had greater gains in attaining the twenty-three general educational goals used to measure this construct than the

other four groups.

Results of Discriminant Analysis

The second multivariate analysis technique used to investigate the data was discriminant analysis. The reason for using this technique was twofold: (1) to determine whether or not the dependent variables could be used as predictors of the goal-commitment variable, and (2) to discover whether or not the six dependent variables were measuring other underlying constructs. The results of the discriminant analysis are presented in Table 9. These results suggested that the first two discriminant functions accounted for most of the variance (75.57% + 16.04% = 91.60%) for these data. In fact, only the first three discriminant functions were significant.

Table 9

Canonical Discriminant Function Results

Function	Eigen Value	% Variance	Canonical Corr.	After Funct.	Chi Square	df	p
				0	179.27	24	< .001
1	.330	75.57	.498	1	47.89	15	< .001
2	.070	16.03	.256	2	16.72	8	.033
3	.025	5.78	.157	3	5.24	3	.155
4	.011	2.62	.106				

Legend: df = degrees of freedom, Corr. = Correlation

In order to more parsimoniously examine the results of a discriminant analysis, two additional items of information were needed: (1) the standardized discriminant function coefficients (Table 10) and (2) the structure matrix (Table 11). This information indicated which of the dependent variables were carrying the same information as the original variable. The standardized discriminant function coefficients suggested that the Career Preparation variable coefficient (-.63721) and the Arts variable coefficient (-.68983) are supplying the bulk of the information for this

Table 10

Standardized Discriminant Function Coefficients

Dependent Variable	Function Coefficients			
	1	2	3	4
Career Preparation	-.637	.294	1.022	-.087
Arts	-.690	-.249	.383	-.746
Communication Skills	.010	.664	-.269	-.384
Mathematics, Science Technology	.023	.540	-.478	-.080
Personal and Social Development	-.129	-.166	-.753	.457
Perspectives of the World	.517	.053	.620	.875

discriminant function (1 in Table 9).

The correlations displayed in the structure matrix helped define any underlying trait that may have been measured by the dependent variables. "The correlations give a direct indication of which variables are mostly aligned with the unobserved trait which the canonical variate (discriminant function) represents. On the other hand, the coefficients are partial coefficients, with the effects of the other variables removed" (Stevens, 1986, p. 235). Klecka(1990) provided a rule-of-thumb to use when interpreting these coefficients. "When the absolute magnitude of the coefficients is very large (near +1.0 or -1.0), the function is carrying nearly the same information as the variable" (p. 31).

In order to interpret the discriminant analysis using these two sets of information, they must be examined juxtapositionally. "That is, use the correlations for substantive interpretation of the discriminant functions, but use the coefficients to determine which of the variables are redundant given that the others are in the set" (Stevens, 1986, p. 236).

The bivariate correlations displayed in the structure matrix suggested that the information included in the six dimensions of the students' perceptions of gains construct, could be explained by just two of the four discriminant functions. These two discriminant functions suggested two underlying constructs. The standardized coefficients

Table 11

Structure Matrix (Correlations)

Dependent Variable	Correlations with Discriminant Functions			
	1	2	3	4
Arts	.69	.32	.28	-.38
Perspectives of the World	.60	.45	.29	.58
Career Preparation	.28	.81	-.07	-.25
Communication Skills	.16	.80	.14	.16
Mathematics, Science Technology	-.36	.64	.55	.01
Personal and Social Development	.17	.60	-.09	.29

indicated the "loading" of a variable's coefficient. Comparing these "loadings" gave the relative contribution of each variable to the discriminant function. That is, the variable with the largest value contributed the greatest amount of information to the discriminant function.

The first discriminant function had the following three dependent variables as its primary contributors: (1) Career Preparation, (2) Arts, and (3) Perspectives of the World. An examination of the correlations in Table 11 suggested that the following dependent variables defined the function:

(1) Arts, and (2) Perspectives of the World. In conclusion, this researcher identified the following underlying construct

Table 12

Classification Results

Actual Group	N	Predicted Goal-Commitment Groups 1	2	3	4	5
1	203	154	47	1	0	1
		75.9%	23.2%	.5%	0%	.5%
2	156	53	96	2	0	0
		34.0%	61.5%	4.5%	0%	0%
3	72	24	39	9	0	0
		33.3%	54.2%	12.5%	0%	0%
4	30	23	3	3	1	0
		76.7%	10.0%	10.0%	3.3%	0%
5	6	5	1	0	0	0
		83.3%	16.7%	0%	0%	0%

Percentage of "Grouped" cases correctly classified = 55.67%

Legend for Group:
1. Prepare for transfer
2. Stay current or advance in job
3. Obtain new skills for new job
4. Personal interest
5. Improve basic skills

measured by discriminant function one: Progress in learning other cultures and societies through visual media such as art, reading, and observation.

Information for the second discriminant function was primarily provided by the following dependent variables: (1) Mathematics, Science, and Technology, and (2) Communication Skills. The variables which were used to define the function were: (1) Career Preparation, (2) Communication Skills, (3) Mathematics, Science, and Technology, and (4) Personal and Social Development. In conclusion, this researcher identified the following underlying construct being measured by discriminant function two: The perception of gains in the core knowledge needed to continue until one's goal is attained.

One other result of the discriminant analysis was obtained by forcing the SPSS program to classify the dependent measures into the five goal-commitment groups. The object of this last analysis was to determine if the set of dependent variables could be used as predictors. The comparison of this forced grouping with the actual grouping is displayed in Table 12.

Only 55.67% of the cases were correctly classified by the discriminant analysis. This percentage seemed to suggest that the dependent variables were not good predictors of goal-commitment group. However, upon closer examination, the first two groups were predicted quite well (75.9% and 61.5% respectively). In comparison to other studies similar to

this one, the overall percentage, 55.67%, was at least as good as those.

Summary

The multivariate analysis suggested that the research hypotheses were tenable except for five of the twenty-four a priori contrasts. The results of the analysis also suggested that students who have different goal-commitments have different perceptions of progress on the twenty-three general education goals measured. As indicated by several researchers of student persistence, this perception of making progress has been linked to an overall satisfaction perception which, in turn, enhances student persistence.

One of the more interesting findings resulted from the discriminant analysis. This analysis suggested that the perception of gains construct could be reduced to two underlying variables, which were the first two discriminant functions.

Conclusions, Implications, and Recommendations

Community college student persistence, defined as attending a community college until a student's reason-for-attendance goal is attained, was the context of this study. Counter to the traditional research in student persistence, neither time limitations nor degree completion was a concern of this researcher and was not included in the persistence definition. As was pointed out by Grosset (1989), Vorhees (1987), and others, using atheoretical models has been a problem in studying community college student persistence.

At least two reasons can be identified for this lack of model development: (1) the lack of clear research constructs for community college student persistence, and (2) the number and complexity of the variables available for the model. This study addressed both of these issues, however, only two of the many possible variables that could have been included in a community college persistence model were examined.

The independent variable was goal commitment, which consisted of five student groups in which each group represented a reason for attending. The dependent variable was the student's perception of gains construct, which consisted of six dimensions. This dependent variable measured the student's perceptions of gains on twenty-three general education goals (a different construct from goal commitment). The impetus for this study was the notion that the more strategic the goal commitment, the greater the progress the student's perception of gains with respect to the general education goals.

These two sets of variables were first investigated as a system, in the multivariate sense, to determine if there were differences between the goal-attainment groups with respect to the dependent variables. After multivariate significance was determined, univariate tests and a priori contrasts were used to investigate which goal-commitment groups were significantly different with respect to each dependent variable.

Conclusions

The results suggested that the first research hypothesis was tenable. That is, there was a significant difference between the goal-commitment groups with respect to the student's perception of gains. The second hypothesis was separated into two parts, the first of which, was analyzed by using univariate tests. The results of these tests suggested that there was a significant difference between the goal-commitment groups with respect to each of the six dimensions of the student's perception of gains construct. A priori contrasts were used to analyze the second part of the hypothesis. The results of these contrasts suggested that there was a significant difference between the transfer group and the other four goal-commitment groups, except for five of the twenty-four contrasts. These significant contrasts suggested that the more strategic the goal commitment, the more likely the student would perceive greater gains.

The importance of establishing this relationship between the student's perception of gains and persistence was given by Stark, Straw, and Lowther (1986). "Since few research studies of academic achievement have included student goals in the student success equation, the potential is largely untapped" (p. 6). Terenzini and Wright (1987) offered additional support for this notion of the importance of goal commitment by stating, "These commitments might well be expected to influence, for example, the amount of effort a student exerts, which, in turn, is likely to affect the level

of that student's academic (and possibly social) integration" (p. 166). This findings of this study supported this notion.

Implications

The implications are separated into three categories: (1) implications for policymakers, (2) implications for those who deal with curricular and classroom-teaching issues, and (3) implications for the institutional effectiveness process (outcomes).

Implications for Policymakers

For policymakers, the results have implications for the following outcomes: (1) student-institutional fit, (2) enrollment policies, (3) support services, and (4) student retention. Goal commitment has been linked to student persistence both directly and indirectly. For example, an indirect link has been made through a general satisfaction-of-college-experiences construct. This study showed the viability of the relationship between goal commitment and a student's perception of gains with respect to general education goals. The next research step would be to determine the effect on student persistence of progress made toward attaining these twenty-three goals. One might conjecture that the intervening variable of student satisfaction might have to be investigated first; however, from previous research, this link between the student's perception of gains and student persistence has already been established.

Not much imagination is needed to understand the

necessity for a community college to provide a variety of programs and services to meet the varied needs of the community it serves. This understanding forces a community college to "know its clientele." If congruity does not exist between what students need (goals) and what a community college provides, the college will atrophy.

Since goals motivate and direct human behavior, it stands to reason that colleges would want to assess those goals. By doing a goal assessment of its students, problem areas can be identified which would result in important program changes, curricular improvements, and new or improved support services (such as counseling, job placement, student aid, and so forth). More importantly, goal assessment can bring greater understanding of student persistence. Community colleges should be interested in student persistence and how to help students achieve their goals. Knowing the student's goals, which is an important component of motivation and student behavior, should help community colleges implement changes in various processes to take advantage of the student's goal commitment, thereby improving student persistence.

Institutional mission and goals are the determinants of institutional behavior. Grosset (1989) explains the connection between a community college's mission statement and student persistence.

Policymakers must come to a decision as to the character of their educational mission and therefore to an

> understanding of the purpose for which students are to be admitted and retained within the institution. This exercise should help clarify the types of student departure that will be the object of institutional action and those which are to be considered the natural outcomes of institutional functioning. (Grosset, 1989, p. 14)

This study gives an institution a basis upon which to evaluate its student persistence strategy in light of its mission and goal statements. In other words, if an institution's mission and goals prevent the assessment of student's goals, institutional changes must be made.

Implications for Teachers and Curriculum Directors

The implications for classroom teachers and curriculum directors are quite explicit. How can teachers help students achieve their goals if the faculty are unaware of them? How do faculty expect students to persist if student goals are not being met? The implication in the context of this study is that if faculty help students make progress on attaining their goals, students will tend be more satisfied with their college experiences and will persist.

Teachers have a set of intended goals they expect the students to attain and students have their own set of goals they expect to attain. These two sets of goals not only impact classroom achievement but also impact student persistence. Stark, Straw, and Lowther (1989) describe the role of goals in the classroom by stating, "it increasingly

is apparent that student goals are mediators between the outcomes instructors intend and those students actually achieve" (p. 3). The authors emphasize the importance of student goals by adding the following: ". . . student goals affect student effort, which, in turn, affects and even predicts student learning [emphasis mine]" (p. 3). Student goals should be part of the information a teacher uses to improve the classroom environment. Students who do not perceive they are achieving will not persist. The results of this study supported the notion that goal commitment affects student achievement, directly or indirectly, through the student's perception of gains construct. Teachers should not only have a clearer understanding of the connection between motivation and achievement, but also should also implement this understanding in the classroom.

> As clearly pointed out, . . . , there has been minimal effort to link the objectives of a class with a student's goals. By having both the professor and the student more actively aware of the inter-relationships between the purpose of the course and the goal of the student, there will be a higher motivation to achieve and greater tendencies for retention. (Stark, Straw, and Lowther, 1989, p. xvii)

What has been pointed out as implications of the results for community college faculty, can be repeated for curriculum directors. After all, classroom instruction is curriculum applied.

Unfortunately, "researchers have paid more attention to student goals than have college administers and faculty" (Stark, Straw, and Lowther, 1989, p. 11). Faculty need to pay more attention to student goals. By knowing these goals, a strategy of individualized instruction can be constructed with the intention of helping students attain their goals. On a somewhat broader spectrum, those who advise students could use student-goal information to design a program specifically aimed at helping students attain their goals.

Implications for Institutional Effectiveness

The third category of implications is that of institutional effectiveness. The study focused on one outcome, degree-completion, which is widely used to show institutional effectiveness. The notion of using degree-completion for measuring community college student success was challenged by the results of this study. The attainment of a degree has been a constant indicator of student success in much of the student persistence literature. Some researchers, such as Vorhees and Padula, have argued against using degree-completion as an indicator of community college student success. Other indicators of student persistence are needed, not only to substitute for degree-completion, but also to reflect the actual attendance behavior of community college students. Goal attainment should be one of these indicators.

Outcomes should not be over-emphasized at the abolition of certain input data such as assessing student's goals.

Knowing student goals can be helpful in constructing strategies that will impact outcomes; in particular, persistence.

The implications of this study support the call of other student-persistence researchers for the development of a theoretical model of community college student persistence. It seems reasonable to include goal commitment and the student's perceptions of gains construct in any such model.

Recommendations

This researcher encourages replication of this study. As stated previously, a theoretical community college persistence model is needed. In fact, after considering the diversity of the students who attend community colleges, more than one such theoretical model may be needed. As this study suggested, goal-commitment and/or the student's perception of gains construct are strong candidates for inclusion in any such model.

The data collected for this study was neither representative of the population nor of the data reported in the CCSEQ manual. More care should be taken in the sampling process for subsequent studies. There was also a discrepancy between the results of the factor analysis done by the authors of the CCSEQ on their data, and the one done for this study. As more data are collected, this discrepancy may be resolved.

Many other research questions are possible using the data collected from an administration of the CCSEQ.

Certainly still at issue is the difference between each pair of groups with respect to each dependent variable. Although twenty-four of these contrasts were examined, many more remain. Background variables, such as gender and ethnicity, should be investigated as categorical independent variables. Other questions on the CCSEQ could be used to group students and examine differences with respect to the six dimensions of the dependent variable. One example of this would be to use the "Time spent on campus other than time spent in class" item as a blocking variable. Academic and social integration are important components of many of the student persistence models. Therefore, using the "time-on-campus" variable in the same manner that goal commitment was used in this study could provide insight into the relationship between an integration component of community college students and student persistence.

Each of the above suggestions are made in support of helping build a community college student persistence model. Since so much data are collected by the CCSEQ, many exploratory investigations can be made. Concentration on these suggestions could keep a researcher busy for quite a long time.

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